

File Application of:

Assignee: Micron Technology, Inc.

Serial No.: 09/923,058

Filed: August 6, 2001

Patent No.: 7,049,244

Issue Date: May 23, 2006

For: METHOD FOR ENHANCING SILICON  
DIOXIDE TO SILICON NITRIDE  
SELECTIVITY

Examiner: George A. Goudreau

Dkt. No.: 102-0072US-4

**Certificate**  
**JUN 12 2006**  
**of Correction**

Commissioner for Patents  
P.O. Box 1450  
Alexandria VA, 22313-1450

***Attn: Certificates of Correction Branch***

Sir:

Applicants hereby request pursuant to 35 U.S.C. § 254 and 37 C.F.R. § 1.322 that a Certificate of Correction be issued in the above referenced issued U.S. Patent. Enclosed are two originals of the form PTO-1050 setting forth the requested corrections.

This first correction adds the name of “Lyle Breiner” as an inventor on the front page of the patent. Such correction is warranted, and is the Office’s mistake, because applicant duly filed (and the Office acknowledged receipt of) Applicant’s “Request to Add Inadvertently Omitted Inventor Pursuant to 37 CFR 1.48” (filed November 21, 2003; copy attached). As these papers were sufficient to correct inventorship, it was error for the Office to have not acknowledged Mr. Breiner as an inventor when printing the patent.

The other correction pertains to errors in claims 104-112 in the patent as issued, and specifically corrects the dependency recited in the claims. These claims correspond to

JUN 12 2006

application claims 156-164, and these claims as allowed were entered in a "Response to Office Action Dated April 5, 2005" via Express Mail (tracking no. EV697139236US) filed July 5, 2005 (relevant portions attached, along with postcard acknowledging Office receipt). As that Response shows, application claims 156-164 depended on claim 150, which corresponds to issued claim 98, which is the correction Applicant makes herein.

As these mistakes are believed to be PTO error, it is believed that no fee is due in connection with this request for correction. However, should any fee be deemed necessary, this Office is authorized to deduct any appropriate fees from Deposit Account No. 501922 referencing attorney docket number 102-0072US-4.

The Applicant requests the Examiner to contact the undersigned with any questions related to this filing.

Respectfully submitted,

6/6/06  
Date

Terril G. Lewis  
Terril G. Lewis  
Reg. No. 46,065

WONG, CABELLO, LUTSCH  
RUTHERFORD & BRUCCULERI, LLP  
20333 State Highway 249, Suite 600  
Houston TX 77070

832/446-2400  
832/446-2424 (facsimile)  
wcpatent@counselip.com

CERTIFICATE OF EXPRESS MAIL	
Express Mail Tracking No.:	<u>EV 009 422 519 US</u>
Date of Deposit:	<u>June 6, 2006</u>
I hereby certify that this paper or fee is being deposited with the United States Postal Service "EXPRESS MAIL POST OFFICE TO ADDRESSEE" service under 37 C.F.R. § 1.10 on the date indicated above and is addressed to: Commissioner for Patents, PO Box 1450, Alexandria VA, 22313-1450.	
<u>Rebecca R. Ginn</u>	

**UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTION**Page 1 of 1

PATENT NO. : **7,049,244**  
APPLICATION NO.: **09/923,058**  
ISSUE DATE : **May 23, 2006**  
INVENTOR(S) : **David S. BECKER, Guy T. BLALOCK, Fred L. ROE, Lyle BREINER**

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

**On page 1 (cover), section (75):**

add Inventor: --Lyle Breiner, Meridian ID (US)--

**In column 12, claim 104, line 19:**

"claim 100" should be --claim 98--

**In column 12, claim 105, line 21:**

"claim 100" should be --claim 98--

**In column 12, claim 106, line 23:**

"claim 100" should be --claim 98--

**In column 12, claim 107, line 25:**

"claim 100" should be --claim 98--

**In column 12, claim 108, line 28:**

"claim 100" should be --claim 98--

**In column 12, claim 109, line 31:**

"claim 100" should be --claim 98--

**In column 12, claim 110, line 34:**

"claim 100" should be --claim 98--

**In column 12, claim 111, line 36:**

"claim 100" should be --claim 98--

**In column 12, claim 112, line 39:**

"claim 100" should be --claim 98--

MAILING ADDRESS OF SENDER (Please do not use customer number below):

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: **Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

**JUN 12 2006**

**UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTION**Page 1 of 1

PATENT NO. : **7,049,244**  
APPLICATION NO.: **09/923,058**  
ISSUE DATE : **May 23, 2006**  
INVENTOR(S) : **David S. BECKER, Guy T. BLALOCK, Fred L. ROE, Lyle BREINER**

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

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add Inventor: --Lyle Breiner, Meridian ID (US)--

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This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: **Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

JUN 19 2006

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**RECEIVED IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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MICRON TECHNOLOGY  
Serial No. 09/923,058

102-0072US-4

Response to Office Action Dated 9/25/2003 and Terminal Disclaimer;  
Request to Add Inadvertently Omitted Inventor Pursuant to 37 CFR 1.48;  
Declaration;  
Election Under 37 CFR §§ 3.71 and 3.73; and Power of Attorney;  
PTO-1595, Assignment

NOV 1 2003

Express Mail

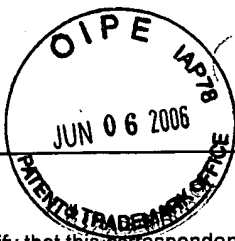
**EV405192762US**

Mailed: 11/21/2003



**JUN 12 2006**

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37 C.F.R. 1.80

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11-21-83  
Date

*R. Clavien*  
Signature

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:  
David Becker et al.

Serial No.: 09/923,058

Filed: 8/6/01

For: METHODS FOR ENHANCING SILICON  
DIOXIDE TO SILICON NITRIDE  
SELECTIVITY (AS PREVIOUSLY  
AMENDED)

Group Art Unit: 1763

Examiner: George Goodreau

Atty. Dkt. No.: 102-0072US-4

**REQUEST TO ADD INADVERTENTLY OMITTED INVENTOR**  
**PURSUANT TO 37 C.F.R. § 1.48(a)**

Commissioner for Patents  
P.O. Box 1450  
Alexandria VA, 22313-1450

Sir:

I, Lyle Breiner, request to be added to the above-referenced patent application as an inventor pursuant to 37 C.F.R. § 1.48(a). Through no deceptive intent on the part of myself or the other inventors, my contributions to the subject matter claimed in this application were initially inadvertently overlooked upon the filing of this application. Written consent of the Assignee and provision for payment of the fee to accompany this request appears below. Also attached is a new declaration executed on behalf of all of the inventors, including myself.

*Lyle Breiner*  
Lyle Breiner

Date: 11/5/2003

JUN 12 2006

\* \* \* \* \*

**WRITTEN CONSENT OF ASSIGNEE TO INVENTORSHIP CHANGE**  
**PUSUANT TO 37 C.F.R. § 1.48(a)**

Pursuant to 37 C.F.R. 1.48(a)(5), Micron Technology, Inc., as Assignee and 100% owner of the above-referenced application, as reflected in assignments recorded at Reel/Frame 6156/0327 and 6780/0996 and/or an assignment which is attached hereto to be recorded at the USPTO, consents to the addition of Lyle Breiner as a co-inventor on this application. The undersigned has authority to execute this consent on behalf of the Assignee.

By: 


Name: Mike Lynch

Title: Chief Patent Counsel

Date: 11-12-2007

\* \* \* \* \*

As filed by counsel for Assignee, who is authorized to act on behalf of the assignee by virtue of a power of attorney submitted herewith:

  
Terril G. Lewis  
Reg. No. 46,065  
Wong Cabello, LLP  
20333 SH 249, Suite 600  
Houston, TX 77070  
phone: 832-446-2422  
fax: 832-446-2424

Date: November 19, 2003

**Applicant authorizes the deduction of the processing fee for this Request (37 C.F.R. § 1.48(a)(4); 37 C.F.R. § 1.17(i)), and the deduction of any other necessary fees, from Deposit Account 501922, referencing 102-0072US-4.**

DECLARATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or the below named inventors are the original, first and joint inventors (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **METHODS FOR ENHANCING SILICON DIOXIDE TO SILICON NITRIDE SELECTIVITY** (as amended during prosecution), the Specification of which:

☒ was filed on August 6, 2001 as Application Serial No. 09/923,058.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims.

I acknowledge the duty to disclose to the Patent and Trademark Office all information known to me to be material to patentability of the subject matter claimed in this application, as "materiality" is defined in Title 37, Code of Federal Regulations, § 1.56.

I hereby direct that all correspondence and telephone calls be addressed to Terril G. Lewis, Reg. No. 46,065, Wong Cabello, LLP, 20333 SH 249, Suite 600, Houston, Texas 77070, (832) 446-2422.

I HEREBY DECLARE THAT ALL STATEMENTS MADE OF MY OWN KNOWLEDGE ARE TRUE AND THAT ALL STATEMENTS MADE ON INFORMATION AND BELIEF ARE BELIEVED TO BE TRUE; AND FURTHER THAT THESE STATEMENTS WERE MADE WITH THE KNOWLEDGE THAT WILLFUL FALSE STATEMENTS AND THE LIKE SO MADE ARE PUNISHABLE BY FINE OR IMPRISONMENT, OR BOTH, UNDER SECTION 1001 OF TITLE 18 OF THE UNITED STATES CODE AND THAT SUCH WILLFUL FALSE STATEMENTS MAY JEOPARDIZE THE VALIDITY OF THE APPLICATION OR ANY PATENT ISSUED THEREON.

This application is a continuation of:

U.S. application serial no. 09/344,277, filed June 30, 1999; which is continuation application of

U.S. application Ser. No. 08/905,891, filed Aug. 4, 1997; which was a continuation of U.S. application Ser. No. 08/152,755, filed Nov. 15, 1993, which was a continuation-in-part of

U.S. application Ser. No. 07/898,505, filed Jun. 15, 1992.

Priority is claimed to all of these prior applications.

09/923,058



Inventor's Full Name:	David	S.	Becker
Inventor's Signature:	<i>David S. Becker</i>		
Country of Citizenship:	U.S.A.	Date:	10-31-03
Residence Address: (street, number, city, state, and/or country)	2399 Sunshine Dr. Boise, Idaho 83712		
Post Office Address: (if different from above)	n/a		

Inventor's Full Name:	Guy	T.	Blalock
Inventor's Signature:	<i>Guy T. Blalock</i>		
Country of Citizenship:	U.S.A.	Date:	10/29/03
Residence Address: (street, number, city, state, and/or country)	2178 N. Greenview Ct. Eagle, Idaho 83616		
Post Office Address: (if different from above)	n/a		

Inventor's Full Name:	Fred	L.	Roe
Inventor's Signature:			
Country of Citizenship:	U.S.A.	Date:	
Residence Address: (street, number, city, state, and/or country)	8887 Craydon Boise, Idaho 83704		
Post Office Address: (if different from above)	n/a		

Inventor's Full Name:	David	S.	Becker
Inventor's Signature:			
Country of Citizenship:	U.S.A.	Date:	
Residence Address: (street, number, city, state, and/or country)	2399 Sunshine Dr Boise, Idaho 83712		
Post Office Address: (if different from above)	n/a		

Inventor's Full Name:	Guy	T.	Blalock
Inventor's Signature:			
Country of Citizenship:	U.S.A.	Date:	
Residence Address: (street, number, city, state, and/or country)	2178 N. Greenview Ct. Eagle, Idaho 83616		
Post Office Address: (if different from above)	n/a		

Inventor's Full Name:	Fred	L.	Roe
Inventor's Signature:	<i>Fred L. Roe</i>		
Country of Citizenship:	U.S.A.	Date: 11/20/03	
Residence Address: (street, number, city, state, and/or country)	8887 Craydon Boise, Idaho 83704		
Post Office Address: (if different from above)	n/a		

Inventor's Full Name:	Lyle	Breiner
Inventor's Signature:	<i>Lyle Breiner</i>	
Country of Citizenship:	U.S.A.	Date: 11/03/03
Residence Address: (street, number, city, state, and/or country)	3050 Val Vista Court Meridian, Idaho 83642	
Post Office Address: (if different from above)	n/a	

JUN 12 2006

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MICRON TECHNOLOGY, INC. 102-0072US-4  
Serial No. 09/923,058

Response to Office Action Dated April 5, 2005  
Postcard

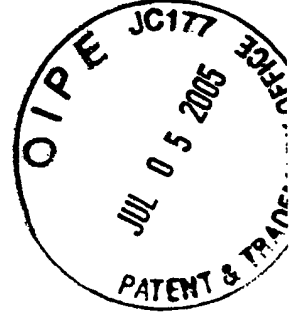
Express Mail EV697139236US

Mailed: July 5, 2005

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JUN 12 2005



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Date Accepted 195	Scheduled Date of Delivery Month 7 Day 4	Return Receipt Fee \$
Mo. Day Year 12 01 05	Scheduled Time of Delivery <input checked="" type="checkbox"/> Noon <input type="checkbox"/> 3 PM	COD Fee \$
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Delivery Attempt	Time	Employee Signature
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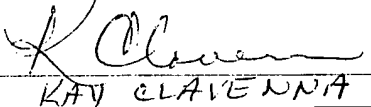
FROM: (PLEASE PRINT) **Terrell Lewis** PHONE: 832 446 2100  
WONG, CABELLO, LUTSCH,  
RUTHERFORD & BRUCCULERI, LLP  
20333 STATE HIGHWAY 249  
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HOUSTON  
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TO: (PLEASE PRINT) **MAIL STOP Amendment**  
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JUN 12 2006

CERTIFICATE OF EXPRESS MAIL	
NUMBER	EV 697139236 US
DATE OF DEPOSIT	July 5, 2005
I hereby certify that this paper or fee is being deposited with the United States Postal Service "EXPRESS MAIL POST OFFICE TO ADDRESSEE" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria VA, 22313-1450.	
 KAY CLAVENNA	Signature

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:  
David Becker et al.

Serial No.: 09/923,058

Filed: August 6, 2001

For: METHODS FOR ENHANCING SILICON  
DIOXIDE TO SILICON NITRIDE  
SELECTIVITY (AS PREVIOUSLY  
AMENDED)

Group Art Unit: 1763

Examiner: George A. Goudreau

Examiner phone: 571-272-1434

Atty. Dkt. No.: 102-0072US-4

**RESPONSE TO OFFICE ACTION DATED APRIL 5, 2005**

Commissioner for Patents  
P.O. Box 1450  
Alexandria VA, 22313-1450

This paper responds to the office action dated April 5, 2005. As this response is filed within the three-month period for response, it is believed that no extension of time fees are due. However, excess claim fees may be due as a result of claims added to the application in this response. *This Office is authorized to deduct any necessary fees from Deposit Account No. 501922, referencing docket number 102-0072US-4.*

Reconsideration of the application is respectfully requested.

JUN 19 2006

greater than or equal to 10-to-1, wherein the semiconductor wafer is heated during plasma etching by heating an electrode adjacent to the semiconductor wafer.

151. (new) The method of claim 150, wherein the etch environment comprises a first gas selected from the group comprising  $\text{CH}_3\text{F}$  and  $\text{CH}_2\text{F}_2$ .

152. (new) The method of claim 151, wherein the etch environment further comprises a second fluorinated gas.

153. (new) The method of claim 152, wherein the second fluorinated gas is selected from the group consisting of  $\text{CF}_4$  and  $\text{CHF}_3$ .

154. (new) The method of claim 152, wherein the etch environment further comprises an inert gas.

155. (new) The method of claim 154, wherein the inert gas is argon.

156. (new) The method of claim 150, wherein the electrode is heated to between about 20 and 80 degrees C.

157. (new) The method of claim 150, wherein the electrode is heated to between about 30 and 60 degrees C.

158. (new) The method of claim 150, wherein the electrode is heated to between about 35 and 50 degrees C.

159. (new) The method of claim 150, wherein the silicon oxide-to-silicon nitride selectivity is greater than or equal to 20-to-1.

160. (new) The method of claim 150, wherein the silicon oxide-to-silicon nitride selectivity is greater than or equal to 30-to-1.

161. (new) The method of claim 150, wherein the silicon oxide-to-silicon nitride selectivity is greater than or equal to 50-to-1.

162. (new) The method of claim 150, wherein the silicon oxide layer is formed directly above the silicon nitride layer.

163. (new) The method of claim 150, wherein the silicon oxide is selected from the group consisting of undoped silicon oxide and doped silicon oxide.

164. (new) The method of claim 150, wherein the silicon nitride layer is formed with an uneven topography.